

## **(CE512) WIND ANALYSIS AND DESIGN OF TALL STRUCTURES**

### **Objective of the Course:**

To study the behaviour, analysis and design of tall structures. At the end of this course the student should have understood the problems associated with large heights of structures with respect to loads (wind and earthquake and deflections of the structure).

### **UNIT-I:**

#### **Introduction**

Basic wind speed, Design wind speed, Design wind pressure, offshore wind velocity, Wind pressures and forces in buildings/ structures. External pressures coefficients for various roofs, Dynamic effects. Design of Tall Buildings: Analysis of tall building for lateral loads, cantilever method, Portal method, Factor method; Design of structures for wind; Computer application in analysis & design.

### **UNIT-II:**

#### **Design of shear wall**

Introduction, Types of shear walls, behaviour of cantilever walls with rectangular cross section, Flange cantilever shear walls, Moment – Axial load interaction for shear wall section, Interaction of shear walls and Rigid jointed frames, Shear walls with openings, Coupled shear walls.

### **UNIT-III**

#### **Design of Steel Towers, Trestles and Masts**

Introduction, Loads on towers, Analysis of towers, Masts, Trestles, Stresses in trestles due to vertical loads and horizontal loads, Design of members in towers, Design of foundations.

### **UNIT-IV**

#### **Design of Chimneys (RCC)**

Introduction, Wind pressure, Stresses in chimney shaft due to self weight and wind, Stress in horizontal reinforcement due to wind shear, Stresses due to temperature difference, Design of RCC chimney.

### **UNIT-V**

#### **Design of steel chimneys**

Introduction, Types of chimneys, Forces acting on steel chimneys, design of various components, Stability of steel chimney.

**TEXT BOOKS :**

1. Design of Steel Structures by S.K.Duggal.
2. Design of Steel Structures- vol-II by Ramachandra

**REFERENCE BOOKS:**

- 1 .Reinforced Concrete Structures by Punmia, Jain & Jain
2. Tall Chimneys design by S.N. Manohar.